Spectacular Achievements: Audubon's Animals of North America

Resource Guide

October 22, 2006 to December 17, 2006

William D. Cannon Art Gallery

The Cannon Art Gallery's Three-Part-Art education program for FY 06/07 is funded in part by the California Arts Council, a state agency, and the National Endowment for the Arts, a federal agency; Mrs. Teresa M. Cannon; The Carlsbad Library and Arts Foundation; and the Carlsbad Friends of the Arts.

Spectacular Achievements: Audubon's Animals of North America

Resource Guide

October 22, 2006 to December 17, 2006

William D. Cannon Art Gallery

Table Of Contents

Steps of the Three-Part-Art Program

1. **Resource Guide**: Classroom teacher introduces the preliminary lessons in class provided in the *Spectacular Achievements: Audubon's Animals of North America* Resource Guide. (The guide and exhibit samples are provided free of charge to all classes with a confirmed reservation.)

2. **Gallery Visit**: At the Gallery, our staff will reinforce and expand on what students have learned in class, helping the students critically view and investigate professional art.

3. **Hands-on Art Project**: An artist/educator will guide the students in a hands-on art project that relates to the exhibition.

Outcomes of the Program:

- Students will learn about art galleries and museums and what they can offer.

- Students will discover that art galleries and museums can be fun and interesting places to visit, again and again.

- Students will make art outside of the classroom.

- Students will begin to feel that art galleries and museums are meant for everybody to explore and will feel comfortable visiting.

- Students will go to other galleries and museums and use their new art-related vocabulary.

How to Use This Resource Guide

This resource guide is provided as a preparation tool to investigate the artwork of **John James Audubon**. It is written for teachers of diverse subject areas in grades 3 and 4 but can be adapted to different grade levels. The resource guide is provided as a part of the Three-Part-Art education program and is aligned with the Visual and Performing Arts Framework for the State of California. By teaching the lessons and activities in this guide and participating in the tour and art project led by an artist/educator at the Cannon Art Gallery, your students will have the opportunity to take part in a truly comprehensive visual art experience.

To get started:

• Begin reading through the guide before using it with your students. Familiarize yourself with the artist, vocabulary, questioning strategies provided with each image, and suggested art activities.

• Remind students that art is a form of communication and that museum and gallery exhibitions are not "the truth" but interpretations of the world.

• Each lesson includes an image accompanied by questions. Teachers should facilitate the lessons by asking students the questions while looking at the image. To have a successful class discussion about the artworks, plan to spend at least 10 minutes on each image.

• Encourage looking! Encourage students to increase their powers of observation and to learn by seeing. Challenge students to look closely and to be specific in their descriptions and interpretation of the artworks.

• Looking and considering take time. Wait a few seconds for students' responses.

• Your students' responses to the questions in this guide may vary. Be open to all kinds of responses. Respond to your students' answers and keep the discussion open for more interpretations. For example, "That's an interesting way of looking at it, does anyone else see that or see something different?" Remind students to be respectful of others and to listen carefully to each others' responses.

• Most lessons have corresponding activities. If time is available, it is recommended to follow the lessons with the suggested activity—each lesson will reinforce what the students learned by looking at the artworks.

Making The Most Of Your Gallery Visit

Visiting the Cannon Art Gallery is "Part Two" of the Three-Part-Art education program. A carefully planned gallery visit will greatly enhance your students' classroom learning and provide new insights and discoveries. The following guidelines were written for visiting the Cannon Art Gallery, but also apply to visiting any other gallery or museum.

(Student nametags are GREATLY appreciated.)

School Visits to the Cannon Art Gallery:

School groups of all ages are welcome free of charge at the Cannon Art Gallery with advance reservations. Reservations are accepted by phone only at (760) 434-2901 and are on a first-come, first-served basis. Priority is given to third and fourth grade classes serving Carlsbad students. You will be notified within 48 hours if your request can be accommodated. We request that at least one adult accompany every five students. If any of your students have any special needs, please let us know when you make the reservation. The docent-led tour and related hands-on art projects take approximately one hour each. The Resource Guides are written to address 3rd and 4th graders, but the guides may be adapted for other grade levels as well.

Late Arrivals and Cancellations:

As a courtesy to our gallery staff and other visiting groups, please let the gallery know if your group will be late or cannot keep their reservation. We will not be able to accommodate any group that arrives later than 10 minutes from their appointed time without notice. To cancel your visit, please call at least one week in advance of your scheduled visit, so we can fill the vacated slot with a class from our waiting list. It is the teacher's responsibility to arrive promptly at the scheduled time and let the docent know that the group is ready for their visit. Please make prior arrangements for someone to cancel reservations in case of an emergency or illness. Schools and classes with a history of frequent cancellations will be considered a lower priority for future tour reservations.

Gallery Visit Checklist:

- Allow appropriate travel time so that your tour begins on time.

- Plan ahead for chaperones. Make sure that they understand they are to remain with the students during the entire visit and that it is inappropriate to talk privately during the docent-led tour.

- Visit the exhibit beforehand so that you can preview the artwork.

- Make sure that your students understand the Gallery etiquette. Please see next page.

Gallery Etiquette:

Please go over the following points with your students (and chaperones) and make sure they understand why each rule must be followed.

- No eating or drinking.
- Remember to look and not touch the artwork. Fingerprints damage the artwork.
- Please no talking when the docent is talking. (The Gallery has poor acoustics.)
- Please remind all adults to turn off their cell phones while participating in the program.
- Please walk at all times.

Chaperones and teachers must stay with the group. The artist/educators need to direct their full attention to helping your students learn about the exhibition and art project.

Program Evaluation:

In order to continue providing the highest quality resource guides, docent tours, and hands-on art projects, we ask that the classroom teacher complete an evaluation form after participating in the program. Careful consideration is given to teacher input so that we can best address your students' needs. Please feel free to share your comments and concerns with any gallery staff as well. Or, you may contact the Arts Education Coordinator directly at (760) 434-2901.

Curriculum Connections

Adapted from the 3rd and 4th grade Content Standards for California.

This guide is designed to assist teachers with the instruction of art-centered lessons that are aligned with the 3rd and 4th grade Content Standards for California. Each lesson concentrates on teaching one or more of the content areas below through a meaningful exploration of the artworks in this guide.

VISUAL ARTS

Grade 2

• Students perceive and respond to works of art, objects in nature, events, and the environment. They also use the vocabulary of the visual arts to express their observations.

• Perceive and describe repetition and balance in nature, in the environment, and in works of art.

• Perceive and discuss differences in mood created by warm and cool colors.

Grade 3

• Students perceive and respond to works of art, objects in nature, events, and the environment. They also use the vocabulary of the visual arts to express their observations.

• Students perceive and describe rhythm and movement in works of art and in the environment.

• Students describe how artists use tints and shades in painting.

• Students identify and describe how foreground, middle ground, and background are used to create the illusion of space.

• Students compare and contrast two works of art made by the use of different art tools and media (e.g., watercolor, tempera, computer).

• Students identify and describe elements of art in works of art, emphasizing line, color, shape/form, texture, space, and value.

• Students apply artistic processes and skills, using a variety of media to communicate meaning and intent in original works of art.

• Students explore ideas for art in a personal sketchbook.

• Students paint or draw a landscape, seascape, or cityscape that shows the illusion of space.

• Students create a work of art based on the observation of objects and scenes in daily life, emphasizing value changes.

Grade 4

• Students describe and analyze the elements of art (e.g., color, shape/form, line, texture, space, value), emphasizing form, as they are used in works of art and found in the environment.

• Students use shading (value) to transform a two-dimensional shape into what appears to be a three-dimensional form (e.g., circle to sphere).

• Students use contrast (light and dark) expressively in an original work of art.

• Students describe how the individual experiences of an artist may influence the development of specific works of art.

SCIENCE
Grade 1
Life Sciences

• Plants and animals meet their needs in different ways. As a basis for understanding this concept:
Students know different plants and animals inhabit different kinds of environments and have external features that help them thrive in different kinds of places.

• Students know both plants and animals need water, animals need food, and plants need light.

• Students know animals eat plants or other animals for food and may also use plants or even other animals for shelter and nesting.

• Students know how to infer what animals eat from the shapes of their teeth (e.g., sharp teeth: eats meat; flat teeth: eats plants).

Investigation and Experimentation

• Students will:

Draw pictures that portray some features of the thing being described.

Record observations and data with pictures, numbers, or written statements.

Describe the relative position of objects by using two references (e.g., above and next to, below and left of).

Grade 2
Life Sciences

• Scientific progress is made by asking meaningful questions and conducting careful investigations. As a basis for understanding this concept and addressing the content in the other three strands, students should develop their own questions and perform investigations. Students will:

Make predictions based on observed patterns and not random guessing.

Compare and sort common objects according to two or more physical attributes (e.g., color, shape, texture, size, weight).

Write or draw descriptions of a sequence of steps, events, and observations.

Follow oral instructions for a scientific investigation.

Grade 3
Life Sciences

• Adaptations in physical structure or behavior may improve an organism's chance for survival. As a basis for understanding this concept:

Students know plants and animals have structures that serve different functions in growth, survival, and reproduction.

Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.

Investigation and Experimentation

• Students will differentiate evidence from opinion and know that scientists do not rely on claims or conclusions unless they are backed by observations that can be confirmed.

• Predict the outcome of a simple investigation and compare the result with the prediction.

• Collect data in an investigation and analyze those data to develop a logical conclusion.

Grade 4
Life Sciences

• All organisms need energy and matter to live and grow. As a basis for understanding this concept: Students know producers and consumers (herbivores, carnivores, omnivores, and decomposers) are related in food chains and food webs and may compete with each other for resources in an ecosystem.

Investigation and Experimentation

• Students will differentiate observation from inference (interpretation) and know scientists' explanations come partly from what they observe and partly from how they interpret their observations.

• Students will measure and estimate the weight, length, or volume of objects.

• Follow a set of written instructions for a scientific investigation.

ENGLISH LANGUAGE ARTS
Grade 3

• Write descriptions that use concrete sensory details to present and support impressions of people, places, things, or experiences.

• Organize ideas chronologically or around major points of information.

• Use clear and specific vocabulary to communicate ideas and establish the tone.

• Clarify and enhance oral presentations through the use of appropriate props (e.g., objects, pictures, charts).

Grade 4

• Quote or paraphrase information sources, citing them appropriately.

• Locate information in reference texts by using organizational features (e.g., prefaces, appendixes).

• Use various reference materials (e.g., dictionary, thesaurus, card catalog, encyclopedia, online information) as an aid to writing.

• Understand the organization of almanacs, newspapers, and periodicals and how to use those print materials.

• Ask thoughtful questions and respond to relevant questions with appropriate elaboration in oral settings.

Introduction To The Artist: John James Audubon

For many Americans, the artist and naturalist John James Audubon (1785-1851) brings up images of birds and topics of conservation—to conserve the natural habitats of wildlife, birds, and the ecosystem. Audubon's *The Birds of North America*, published between 1827 to 1838, is his best-known book. The four-volume set features 435 hand-colored engravings of birds depicted life-size and in their natural habitats. The book, which took more than a decade to complete, was printed on the largest paper then available, called double elephant sheets. These sheets measured a little more than three feet by two feet. After this popular publication, Audubon turned to another subject, the animals of America. The publication, *The Viviparous Quadrupeds of North America*, was published in three volumes dating 1845, 1846, and 1848.

Portrait of John James Audubon by Isaac Sprague, an artist on Audubon's last voyage, 1843.

At the time, Audubon's *The Viviparous Quadrupeds of North America* was among the first publications to depict the animals in the west. In 1843 as he traveled up the Missouri River, Audubon fulfilled his lifelong dream of collecting and depicting western American animal life. This would be Audubon's last major expedition and the culmination of his career.

John James Audubon was born on April 26, 1785 in Saint Dominque (now Haiti), the illegitimate son of a French naval Captain and his Creole mistress who would die shortly after giving birth. In 1788 John James was sent to France where he was adopted by his father's French wife. In France his talents and curiosity developed. Audubon combined his fascination with nature and animals with drawing and painting from a very early age. A largely self-taught artist, he escaped into the woods whenever possible to observe nature, collect specimens, and draw. At age eighteen Audubon was sent to the United States to manage "Mill Grove," a plantation his father owned in Pennsylvania. Soon after moving to the U.S. he married Lucy Bakewell, literally "the girl next door." Managing "Mill Grove" proved to be uninspiring for Audubon who preferred to be outdoors exploring and painting. After a series of business venture failures, declared bankruptcy, and two sons to support, Victor Gifford (1809-1860) and John Woodhouse (1812-1862), Audubon went into a deep depression. In this desperation Audubon decided, with the encouragement and support of his wife, to risk his future on his artistic abilities. Finally in 1820, Audubon pursued his dream to paint all the birds in America. The success of *Birds* inspired Audubon to compile another collection, this time featuring the animals of America.

Audubon's Animals

Audubon wanted to make the same monumental effort with America's mammals as he did with America's birds. In 1839 he printed a prospectus for a publication to be called *The Viviparous Quadrupeds of North America* (literally, four-footed animals bearing live off-spring.) The scope was narrowed to terrestrial animals—no winged or marine mammals. Audubon expected the animal specimen collecting and painting to take two years but the project proved to be more difficult than he had expected. Audubon was greatly aided by his longtime friend Dr. John Bachman, a Lutheran minister and preeminent naturalist scholar in Charleston, South Carolina. Bachman served as the scientific adviser, primary writer, and co-author of the book.

Audubon had already begun painting some mammals and collecting specimens before he traveled west to study large mammals like buffalo, mountain sheep, and antelope. In 1841 Audubon bought land and built a home in New York City (now Upper Manhattan) along the Hudson River and the following year moved to the new home. The nearby Hudson River supported habitats for many varieties of animals and plants. Here is where Audubon drew some of his best works for the *Quadrupeds*. In 1843 Audubon, along with four others, finally made his trip west. He traveled the length of the Mississippi and Ohio Rivers and up the Missouri as far as Fort Union near the mouth of the Yellowstone River. Audubon's projects depended on his experience as a field naturalist. He carefully studied each animal in their habitats and noted their physical characteristics and behavior. He believed in the value of first-hand experience and observation—whenever possible he would draw the animals in their natural habitats. Observing and documenting the mammals proved a lot harder than the birds—some animals were nocturnal and their habits were difficult to study. In order to complete his mammal illustrations and text, Audubon was forced to rely on preserved animal specimens sent to him from his contacts in the field and by museums.

Douglass's Squirrel, John James Audubon, 1844, Plate 48

Although Audubon continued to draw specimens after the western journey, his primary contribution to *Quadrupeds* was his early drawings and his vision of the whole project. By 1846 Audubon's mental and physical stamina began to decline. His health deteriorated beyond recovery before *Quadrupeds* was complete. Audubon's sons John Woodhouse and Victor Gifford contributed to the book's completion—John Woodhouse took over his father's position as primary painter and drew over half of the plates of the *Quadrupeds*, and Victor drew many of the backgrounds and managed the sales. Dr. Bachman's sister-in-law, Maria Martin, also contributed to the artwork's backgrounds. John James Audubon spent his final years at "Minnie's Land," until his death in 1851.

John James Audubon pursued his passion to document the birds and mammals of America. His legacy lives on in his life's work and as one of America's most beloved and influential naturalist.

Audubon's Technique And Artworks

No one, I think, paints in my method; I, who have never studied but by piece-meal, form my pictures according to my ways of study. For instance, I am now working on a Fox; I take one neatly killed, put him up with wires, and when satisfied with the truth of the position, I take my palette and work as rapidly as possible.

- John James Audubon from *Audubon and His Journals*

Audubon's early bird and animal drawings were often stiff, unanimated specimens, and drawn in pastel and graphite. As he grew older and his drawings matured, he experimented with how to set up his models, how to best capture the texture and color, the appearance of the feathers, and the overall look of the bird. Audubon discovered that the best way to capture the natural look and position of the birds after he had sketched them in the wild was to shoot them, wire them into position, and place them on a gridded board. He would work quickly to capture the perspective and the colors of the birds before they would fade or decompose. Evident in Audubon's portrayal of birds was his incredible ability to capture texture. For *Quadrupeds*, he transferred this ability from feathers to fur. The majority of the birds he painted were studied alive, but for the *Quadrupeds* he often used skins and specimens. With help from written animal descriptions sent to him by Bachman, Audubon was able to give life to the skins and paint the animals naturally.

Audubon's technique continued to evolve; instead of using just pastel and graphite he began to combine these mediums with several others: watercolor, gouache, oil paint, metallic paint, chalk, ink, and glazes. As time went on, he used watercolor predominantly which he would mix with other mediums to achieve his goal of portraying wildlife in a most naturalistic way. His style of painting was the same for the mammals as it had been for the birds. Audubon would lightly sketch the subject and then follow the outline closely with paint. At times he would make minor changes to the original sketch but primarily Audubon's initial vision remained unchanged.

Douglass's Spermophile, John James Audubon, 1841. Watercolor on paper. Collection of the The New York Historical Society.

Audubon's animal depictions were a departure from the typical scientific illustrations common at the time. Instead of portraying static animals on a page, Audubon's images reveal animals in motion—lively, dynamic and amid their natural surroundings.

Lithography

When the *Quadrupeds* paintings were complete they were printed for publication. Copperplate engraving was used for *Birds of America* but by the time of *Quadrupeds,* a new and less expensive printing process was available called lithography.

Lithography was a faster way to complete the prints for publication. In the lithographic process, artists use a greasy or waxy crayon to draw directly on a stone, which is a special soft and smooth stone cut into various sizes. When the drawing is complete, the stone is bathed with a special solution to "fix" the drawing to the stone. Next it is wiped with a wet sponge and the stone absorbs water except for the parts covered with greasy ink. Then ink is applied to the stone with a roller and adheres to the drawing. The printer then puts the paper on the stone, applies pressure, and then pulls the print from the stone. The image is reproduced on the paper. For Audubon's *Quadrupeds,* a team of artists then hand-colored the prints to match the original watercolors. Often, each colorist would be assigned a section of the image and would apply only one color at a time, then pass the work to the next colorist.

Perhaps in part because the *Birds of America* prints were so large and costly, Audubon decided, along with Bachman, to print *Quadrupeds* on smaller sheets—twenty-eight by twenty-two inches. Most of the animal compositions were horizontal, although many of those showing tree-dwellers such as squirrels and chipmunks, were vertical. The dimensions accommodated more or less life-size drawings of smaller creatures, which were labeled "natural size," but there could be no consistent scale for the larger animals.

The National Audubon Society

John James Audubon had no role in creating the organization that bears his name, yet he was the inspiration. In 1886, George Bird Grinnell, then editor of *Forest and Stream* magazine and former student of Lucy Bakewell Audubon, encouraged readers to join him in creating an organization to protect birds from slaughter. Hats with feathers and even entire birds were fashionable at the time. Grinnell formed the first Audubon Society to honor the artist whose pictures he loved as a boy. With close to 40,000 initial members and many more than expected, the following year Grinnell had to disband the group. Audubon societies were subsequently established independently and by 1905 the groups incorporated into the *National Audubon Society*. Today the *National Audubon Society* continues to protect birds and other wildlife through its mission to conserve and restore natural ecosystems, focusing on birds and other wildlife, and their habitats, for the benefit of humanity and the earth's biological diversity.

About The Exhibition:
Spectacular Achievements: Audubon's Animals Of North America

The seventy original, hand-colored lithographs in this exhibit from John James Audubon's (1785-1851) magnum opus, *The Viviparous Quadrupeds of North America* published between 1845 and 1848 by John T. Bowen of Philadelphia are some of the finest images of North American animals ever made.

In the late 1830s, as the details were being finalized for the completion of his monumental *Birds of America* project, Audubon began to collect material for an equally impressive study of North American animals. The *Quadrupeds* proved more difficult to observe and document than he had anticipated. He was greatly aided by his two sons, John Woodhouse and Victor Gifford, and by his good friend, Dr. John Bachman, a Lutheran minister in Charleston, South Carolina. The first specimens he collected were shipped to him at his home in New York preserved in barrels of rum. He would later make the journey up the Missouri River in the footsteps of George Catlin, Karl Bodmer, and Alfred Jacob Miller to personally document the little-known wildlife of the frontier.

Like his *Birds of America*, the *Quadrupeds* are wonderfully animated, expertly executed, and beautifully printed in large (28"x 22") format. According to experts, only 300 complete sets of 150 images were sold by subscription making the works very rare.

Spectacular Achievements: Audubon's Animals of North America is a unique opportunity to view Audubon's lithographic works and to appreciate his skills as an artist, observer and interpreter of nature. The exhibit includes many glamorous and popular animals including: Ocelot, Jaguar, Lynx, Male Cougar, Female Cougar, Grizzly Bear, Beaver, Black Wolf, Red Texan Wolf, Wolverine, Virginia Opossum, Northern Hare, Cross Fox, Collared Peccary, Horned Antelope, and Columbian Black Tailed Deer to mention a few. As masterpieces of art and science that are entirely American, this exhibit is guaranteed to have wide audience appeal.

The exhibition at the Cannon Art Gallery is part of a twelve city national tour over a two and a half year period. The tour was developed and managed by Smith Kramer Fine Art Services, an exhibition tour development company in Kansas City, Missouri.

What Is A Mammal?

Think about these different species: a human being, a bear, a cat, a blue whale, a sheep, and a bat. What do they have in common? They are all mammals. Human beings are just one of the 4,000 or so mammal species on our planet. Mammals are classified by two shared characteristics—they all feed their young with milk produced by female mammals, and they all have hair.

Most mammal babies develop or grow inside their mother's body. After the babies are born, they drink milk directly from their mother's body. Mammal parents also feed their young longer and protect them longer than any other animals do. Hair is another trait common to all mammals. No other animals—insects, fish, reptiles—grow true hair. A mammal's hair keeps them warm and dry and helps them survive in a range of habitats—the special place and conditions that each kind of wildlife needs to live and grow. Some mammals have lots of hair such as a bear, while others like newborn whales have so little hair you hardly see it at all.

Animals are only classified as mammals if they nurse their young with mammary gland milk and have hair, but most mammals also have legs and feet adapted for survival, differentiated teeth, and are warm-blooded. A deer's hooves help it run swiftly, while a bat's front legs have changed, or evolved, into wings over millions of years. Whales don't have hind legs, but many kinds of whales have bones where hind legs would be. Most mammals also have four kinds of teeth. Mammals have developed some teeth especially for eating certain kinds of foods. For example, a horse's flat, wide molars help grind grass and other plants while a wolf's sharp canine teeth help to tear meat. Lastly, and very importantly, is a mammal's ability to maintain a constant body temperature despite climate changes—this is their "warm-bloodedness." Because a mammal's body temperature stays the same, they can have active lives day and night, in hot habitats or cold ones.

Animal Classification: So Why Do Animals Have Scientific Names?

Mammals, like other animals, plants, and even microorganisms, are grouped or classified into a scientific system called taxonomy. The classification system we use today was developed long ago by a Swedish naturalist Carolus Linnaeus (1707-1778) who separated animals and plants according to certain physical similarities. He then gave identifying names to each species. (Each kind of animal is known as a species.) Linnaeus used Latin and Greek words for the names because at the time that's what was used for literature and science. Today we use the same system, yet it is more sophisticated, and the words can mean several different things: they might describe how an animal or plant looks, where it is found, or who discovered it.

Most people don't know the scientific names of specific animals. Usually an animal's common name is used like bear, dear, or mountain lion. But common animal names can change from region to region or country to country. For example, a puma (or mountain lion) has many common names but only one scientific name, *Felis concolor.* Therefore naturalists, researchers, and scientists use scientific names because they need a more precise way to identify an animal. Plus, scientific names can be recognized any where in the world and in all languages.

Lesson 1: Getting Started
Audubon's animals

1. After reading the *Introductory* sections to yourself, introduce the artist John James Audubon and the exhibition to your students.

2. If you are planning a trip to the Cannon Art Gallery to see the exhibition *Spectacular Achievements: Audubon's Animals of North America,* tell your students about their upcoming visit.

3. Introduce your students to the lesson, and all lessons to follow by explaining that they will be looking at and talking about artworks and animals, specifically mammals. Give your students time to look quietly before asking them questions.

4. Before you begin the lessons, preview the provided images.

5. Due to John James Audubon's failing health during the production of *Quadrupeds*, some of the animal images were completed by Audubon's sons, John Woodhouse and Victor Gifford. For purposes of this guide, the questions that accompany each image refer to the artists as "Audubon."

Image 1
John Woodhouse Audubon
Nine-Banded Armadillo, 1848
Plate 146
Order: Xenarthra
Family: Dasypodidae
Species: Dasypus novemcinctur
Common Modern Name: Nine-Banded Armadillo

Image 2
John Woodhouse Audubon
Prong-Horned Antelope, 1845
Plate 77
Order: Artiodactyla
Family: Antilocarpridae
Species: Antilocapra Americana
Common Modern Name: Pronghorn

The questions that accompany the Nine-Banded Armadillo and Pronghorn Antelope images examine some of the different art elements artists commonly use in an artwork. Consider these questions while looking at all the animal images in this resource guide.

Show Image One and Image Two to your students and use the questions on the next page (the same questions are on the back of the images) to guide your students in a discussion.

• Look closely at the Nine-Banded Armadillo. Imagine that you are petting the Armadillo. Describe how it would feel. Use different textures in your answer. Does it look soft, hard, bumpy, smooth? Explain. (*The most easily recognized feature of an armadillo is its shell. All armadillos have shells, made of true bone that cover their backs. Most armadillos also have bony rings or plates that protect their tails. Because their backs are covered with bone, armadillos are not very flexible*.)

Did you know? The armadillo, along with the pangolin (commonly found in Africa and looks like a scaly anteater), are the only mammals to have reptile-like scales instead of fur.

• Now look at the Pronghorn Antelope. Describe how it would feel to pet the antelopes. How are the two animals different?

• Look again at the Armadillo. What shapes do you see on the animal's shell? Describe what you see. Now look closely at the Antelope. Describe the patterns and colors that you see on the antelope's fur.

• Many mammals have defense strategies that protect them from predators in the wilderness. By looking at the two images, in what ways do you think the Antelope protects itself? How do you think the Armadillo can protect itself? (*Antelope use their horns in defense against predators. Males and sometimes females also use them to establish their position in a herd or to fight rivals. All antelope species have horns, although in some species they are only found on the males.The armadillo's hard shell acts as armor for the animal but an alternative defense is to dig in the ground and burrow in holes to protect itself from predators*.)

• In what other ways do animals protect themselves from predators? Think of other mammals and how they show physical signs of self-defense. (*i.e., baring of teeth, playing dead, porcupine quills for defense, etc*.)

• Look again at both images. Now look closely at the colors in the two landscapes. Describe the colors of the things farthest away, in the background. (*i.e., blues and grays used in mountains of Antelope; cool colors of clouds and hill of Armadillo*.)

• How do these colors differ from the colors of things up close, in the foreground? *(i.e., the deep yellows and browns used in both images*.) Explain that artists like Audubon use cooler and duller colors in the background to portray an illusion of depth, and gradually use warmer colors in the middle ground and foreground to make things advance and appear closer in a picture.

Lesson 2

Image 3
John James Audubon
Red Texan Wolf
Plate 82
Order: Carnivora
Family: Canidae
Species: Canis rufus
Common Modern Name: Red Wolf

Show Image Three to your students and use the questions below (the same questions are on the back of the image) to guide your students in a discussion.

• Look closely at the image. Imagine walking into the picture. What would it be like? Is the ground soft, dusty, or rough? Do you hear any sounds? Is it warm or cool? Explain.

• What colors do you see? (*i.e., reds, browns, greens, blues*) Where do you see the colors repeated in the picture? (i.e., reds and browns in foreground and on wolf, blues in the foreground)

• What repeated textures and shapes do you see? (*i.e., the shell and rock shapes in foreground, texture of the wolf's fur, and the texture of the trees in background*.)

Explain to students that artists like Audubon carefully place each element into a particular place of an artwork. *This is called composition—the placement or arrangement of the elements of art in a work. Artists also repeat colors, textures, and shapes to guide our eyes through a painting. This is called rhythm*.

• Again look closely. What's going on in this picture?

• Does it look like the wolf is sniffing something? Explain what you see. (*He is sniffing at a buffalo bone. Wolves eat meat almost exclusively. Wolves work as a team to attack herds of animals.*)

Wolves, like many other animals, communicate by scent marking: leaving their urine on trees or rocks where other wolves will find it. This is to let others know that the area is claimed.

• What other animal(s) do you know of that marks its territory with urine? (*dogs, coyotes*)

Wolves belong to the same family of animals as the dog, or Canidae, you may have as a family pet.

Suggested Activity For Lesson 2
Mammal Senses

FOCUS
Sight, hearing, smell, taste, and touch help mammals survive in the wild. Many mammals rely on their keen sense of smell to locate food, to avoid danger, to mark territory, and to find a mate. For example, bears who have poor vision and hearing rely on their noses to find food, and the mole has an extremely sensitive muzzle that helps it find food through touch and smell. As humans we mostly depend on our vision, so it is hard to imagine how some mammals depend on their noses to accurately smell scents and odors.

Time: 30 minutes

Materials:
- Cotton balls
- Different scents (Ideas include scented oils, vinegar; perfume; or extracts of vanilla, almond, peppermint, anise, maple, and lemon.)
- A brown or manila envelope for each student (Some scent marks have distinctive colors. Using the dark-colored paper encourages the students to use only their noses—and not their eyes—in this activity.)

Preparation:
Divide the number of envelopes to be used by the number of scents you have collected. Before the lesson, use a cotton ball to rub a scent onto the adhesive strips of the envelopes. Each envelope gets one scent only. Repeat this process with the remaining scents and envelopes. For example, if you have 32 students in your class and have eight different scents, then four envelopes would get one scent, four would get another, and so on.

Procedure:
1. Give each student a scented envelope. Tell the students to smell their envelope, and then have them try to find classmates whose envelopes smell like their own. After about 10 minutes of sniffing, make sure each student is in a "scent" group.

2. Have students brainstorm adjectives describing how it felt to rely on their sense of smell to locate other students. Review the different ways animals use scent.

Here are some fun animal scent facts to share with your students:
- Jaguars are nocturnal animals that rely on their sense of smell to find prey in the dark.
- Giant pandas usually live alone, but they can use their keen sense of smell to find each other in thick bamboo forests.
- The rhinoceros has poor eyesight. It relies on its strong sense of smell to find other rhinos, even when they're far away.
- The Komodo dragon's keen sense of smell helps it zero in on rotting meat from more than a mile away.
- Asian lions live in groups called "prides." They leave scent marks to warn other lions to stay away from the pride's territory.

This activity was adapted from a classroom kit by the San Diego Zoo's Education Department.

Suggested Activity
Animal Classification

FOCUS
Audubon's *Quadrupeds* are categorized into a system called taxonomy. (See "Animal Classification" on page 16.) There was a tendency for early naturalists of young America to divide types of animals into many sub-categories on the basis of slight differences like a color variation. Today, taxonomy classifications are more sophisticated and species with minor differences form a single species. Many of Audubon's classifications are outdated; however his distinct classifications were more comprehensive than anything published at the time.

There are 19 groups of classification for over 4,000 mammal species. Some groups, called an order, contain hundreds of species—the specific animal in that group—while others only have one species. As you view the artworks in this guide and at the Cannon Art Gallery, notice the scientific names and the common names listed below each animal image.

Time: 30-45 minutes

Materials:
- Pencils
- Paper

Procedure:
1. Read the "Animal Classification" section and discuss with your class how animals are grouped according to physical characteristics among other things. Explain that to classify things means to arrange them into groups based upon some kind of similarity.

2. Tell students that many of Audubon's (and Bachman's) classifications are now outdated but at the time of their research their classifications were more complete than anything published at the time.

3. If there is time, have students do some research online, and with books and encyclopedias, to find the genus (order), family, and species names for some of their favorite animals.

4. Next, explain that just like animals are grouped by shared characteristics so is much of what we do in our daily lives. For example, when we put our clothes away we may group our clothes according to types: socks go into one drawer, t-shirts in another drawer, shorts in another, and so on.

5. Divide your class into groups and have the students create their own classification system using items in the classroom. Students should use at least two levels of classification, but they can use more if desired. Encourage them to start with one classification level that divides the selected classroom objects into two categories. For example, classroom objects divided by materials such as plastic and wood, then divide those into useful objects and decorative objects; or classroom objects divided into materials used for writing such as writing instruments (i.e., pencils, pens, crayons, markers, chalk) and things to write on (i.e., blackboards, dry erase boards, easels, paper, desks).

6. The students' systems of classification should be shared in class. Discuss with the class how different student groups classified the same objects in different ways.

This activity was inspired by lessons found on discoveryschool.com an education site of discovery.com.

Lesson 3
Audubon's Bears

Image 4
John Woodhouse Audubon
Grizzly Bear, 1848
Plate 131
Order: Carnivora
Family: Ursidae
Species: Ursus arctos
Common Modern Name: Grizzly Bear

Show Image Four to your students and use the questions below (the same questions are on the back of the image) to guide your students in a discussion.

• Look closely at the picture. Does the bears' fur look soft or rough? Describe the lines and shapes that you see that create texture. (*i.e., numerous short and long lines, curves, and thick and thin lines make up the texture of the fur*.)

• Now, look closely at the bears. If you could use only geometric shapes to draw these bears, what shapes would you use? Explain.

Geometric shape—a shape that obeys the laws of geometry. Examples include a circle, oval, triangle, rectangle, square, and so on.

• Look at the colors in this work of art. What different colors did the artist use to paint the bears? (*Notice the grizzlies' whitish tips on their hair; this gives them a "grizzled" look which means streaked with gray*.) What other colors do you see in the artwork? Why do you think these colors were used?

• By looking closely at the bears' surroundings, what clues can you find about the bears' habitat—the environment needed by a particular species for survival. (*Grizzlies live inland away from the ocean unlike the coastal brown bear. They eat meat, although plants, berries, and nuts make up most of their diet*.)

• What makes this work of art look real to you? What makes it look unreal?

Did you know?
Our State Animal: The California Grizzly Bear
The California grizzly bear (Ursus californicus) was designated official State Animal in 1953. Before dying out in California, this largest and most powerful of carnivores thrived in the great valleys and low mountains of the state, probably in greater numbers than anywhere else in the United States. As humans began to populate California, the grizzly stood its ground, refusing to retreat in the face of advancing civilization. It killed livestock and interfered with settlers. Less than 75 years after the discovery of gold, every grizzly bear in California had been tracked down and killed. The last one was killed in Tulare County in August 1922, more than 20 years before the authority to regulate the take of fish and wildlife was delegated to the California Fish and Game Commission by the State.

- From the California State Library Web Site, History and Culture

Suggested Activity For Lesson 3
Drawing A Grizzly Bear

FOCUS
After viewing and discussing Audubon's *Grizzly Bears,* have students draw their own bear.
Drawing things in nature is easy when you start with basic shapes. With practice students can change flat shapes into three-dimensional forms. Have students draw lightly so they can erase if they need to.

Time: 10 minutes for the warm-up, 50 minutes for bear drawing

Materials:
- Warm-up sheet to practice animal textures. See Appendix.
- Pencils—drawing pencils preferably—drawing pencils are numbered according to how hard or soft the lead is, pencils with an "H" mean the lead is hard, "B" means the lead is soft. 2Bs work well for drawings.
- Colored pencils to complete drawing with color
- Drawing paper any size available
- Erasers—preferably kneaded erasers to erase exactly what you want

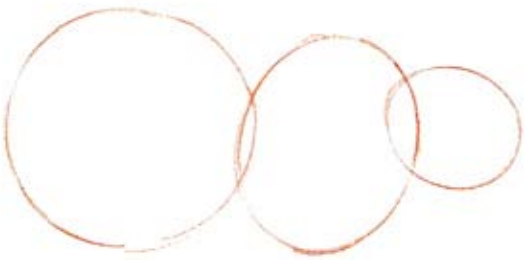
Procedure: Warm-up

Fur and Texture
Having hair is one of the defining characteristics of being a mammal so it is an important element in drawings of wild animals such as bears. A bear's fur consists of two types of hair—the under fur and the outer guard hairs. The under fur is soft and dense and serves primarily as an insulator. The outer guard hairs are much thicker, longer and coarser. While they also insulate, they serve to protect the body from foreign objects such as dirt, debris and insects.

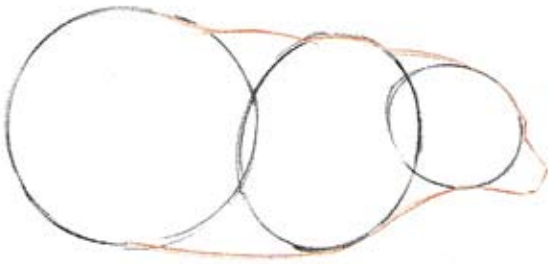
1. Have students use the warm-up sheet to practice drawing the fur of a bear and also a bear's feet.

Procedure: Bear Drawing

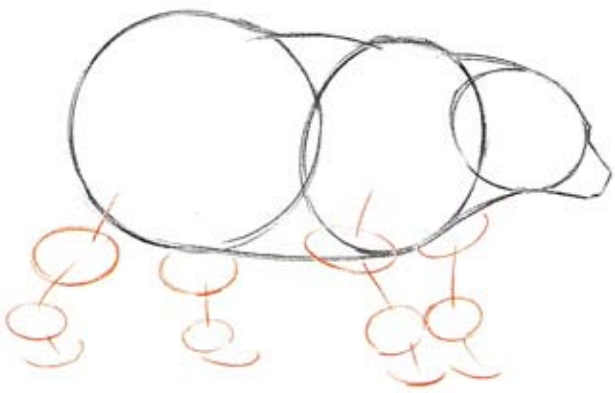
1. Start drawing the bear by making three slightly overlapping ovals. Draw a bigger circle for the rear. Add a circle for the head. The head should be 1/3 to ½ the size of the front circle. The head is often kept at a low angle.



2. Join the bear's shoulder with the hind quarters by adding slightly curved lines that curve out. Join the head with curved lines to show the muscle/neck. Add the muzzle and nose.



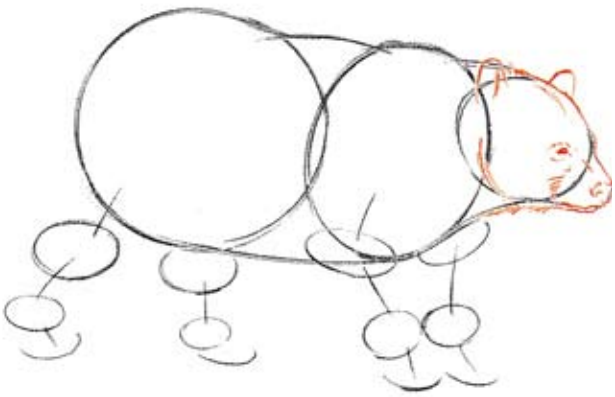
3. Use small ovals connected by straight lines to sketch the front and rear legs. End each leg with a short line and curve to begin the feet.



4. Add a mouth and nose on the snout. Noses have an arched T-shape with a fleshy pad below the nostrils—when viewed from the front they look like a mushroom slice. The top edge of the nose sticks out some from the middle of the nose.

5. Draw an oval above the mouth for the eye and add a dot in the center.

6. Add two half circles on top of the head for ears.



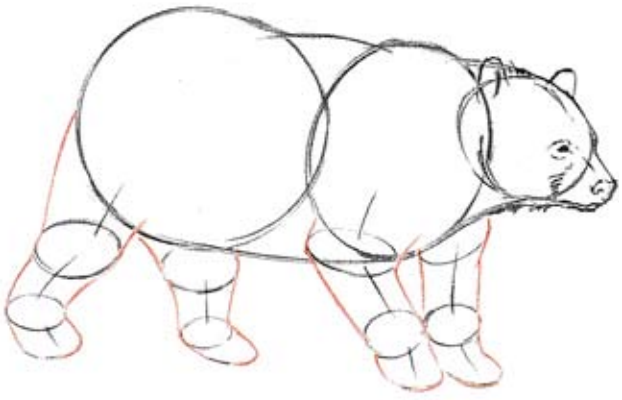
7. Shape the legs by drawing lines on both sides of the leg ovals then connect the lines with a U-shaped line at the bottom of each leg to create the shape of the feet. Bears are flat-footed. Their heels and palms touch the ground, much like humans. Their paws are broad and the long, curved claws are always visible.

8. When students like the lines they've drawn, have them carefully erase all guidelines.

9. Finish the drawing by adding the facial features, fur texture, and tail. Bears have very short and stubby tails which are often obscured by hair.

10. Remind students to use the different techniques they used in the warm-up to capture the texture of the bear's fur and the light and shadow areas on the bear. Darken areas that would be shadowed, like the belly, while keeping other areas light.

11. Add color to the bear using colored pencils. Again, have students pay attention to colors and tones and to remember the "grizzled"—gray streaked color often found on Grizzly Bears.



Bear drawings from *Woodland Animals* by Patricia Walsh and David Westerfield.

Extended Lesson:

• Audubon's animals were a departure from earlier scientific illustrations as they depicted the animals amid their natural surroundings, often in motion and lively as opposed to scientific depictions of dead animals.

By looking at Audubon's Grizzly Bear and at other pictures of Brown Bears in the wild, have students add the bear's habitat to their drawing. Have them keep in mind foreground, middle ground, and background and the use of warm and cool colors while drawing their composition.

Lesson 4
Busy As A Beaver

IMAGE 5
John James Audubon
American Beaver, 1844
Plate 46
Order: Rodentia
Family: Castoridae
Species: Castor Canadensis
Common Modern Name: American Beaver

Show Image Five to your students and use the questions below (the same questions are on the back of the image) to guide your students in a discussion.

• Look closely at the American Beaver. Unlike other naturalists at the time, Audubon's animal illustrations included backgrounds to tell viewers about the animal's habitat. What did the artist include in this image to tell you about the Beavers' habitat? (*i.e., trees, plants, lots of water, sitting on the bank—or slope— above the water*.)

Beavers that live along a river generally make burrows with an underwater entrance in the riverbank. Those that live in quiet streams, lakes, and ponds usually build dams and a lodge (home) with an underwater entrance. They use sticks and mud to build their home just above water level. Tunnels to the lodge lead down to the deep water where they store their food.

• Audubon's animal illustrations also provide clues to the animal's physical characteristics and how it lives. What physical characteristics did the artist emphasize about the Beaver? (*i.e., the Beaver is gnawing at the tree with his front teeth, the Beaver's teeth are shown in profile to show their size, the Beaver's webbed feet are emphasized, as are the front paws*.)

• Did you notice the Beaver's tail? Describe what it looks like.(*i.e., wide, flat, etc*.)

• What does this image tell you about how the Beaver lives?

Beavers gnaw at trees to bite out wood chips and to trim branches. Their big front teeth are sharp and they can take out a large chip of wood in a single bite. The beaver trims off branches, cuts them into convenient sizes, and carries them in its mouth to the dam. There it either eats the bark, turning the branches in its forefeet, or stores them underwater for winter use.

Beavers spend much of their time in water. There large hind feet are webbed, much like a duck's feet. Their feet make them very good swimmers and divers. The Beaver's tail also helps it swim—its wide and flat shape acts like a boat rudder when the Beaver swims side to side and to dive deep. Lastly, when the Beaver sits upright to gnaw at a tree it uses its tail as a brace.

• The American Beaver is primarily nocturnal—an animal that is active at night and inactive during the day. By looking at this artwork what time of day do you think it is? In making this work of art, what problems might the artist have faced along the way?

Suggested Activity For Lesson 4
Nature Journaling

I know a good deal about our Quadrupeds and have many valuable notes about them in my various journals of the woods and swamps.

- John James Audubon written to friend Benjamin Phillips, June 23, 1839
Audubon Papers, Princeton University Library

FOCUS

John James Audubon was fascinated by nature and wildlife as a young boy. He liked to carry his art supplies and a gun into unexplored forests to observe and draw the birds and animals that lived there. Audubon documented his observations—his hunts for birds and animals, their habits and habitats, and what he encountered in the wilderness—in extensive journals, memoirs, and letters to his family and friends.

Nature Journaling is the regular recording of observations, perceptions, and feelings about the natural world around you. It is to study where you live and how you relate to it. Some people do it in written prose or poetry, some through drawing or painting, others with photographs, etc.

Students will create their own nature journal to observe what is happening in their school yard, nearby park, or wherever is suitable for the class.

Time:

Allow time to make a simple journal or use paper and clipboards to get started journaling.
Plan for 10 minutes to talk about journaling and what to expect; 20-30 minutes outdoors observing, drawing, writing; and 10 minutes discussing what the students observed.

Materials:

For the Journal:*

- 8 ½" x 11" copy paper or 9" x 12" drawing paper
- Construction paper, tag board, cardstock, 9" x 12" in a variety of colors for the covers
- Hole punch, 3-ring hole punch and/or scissors to make binding holes
- String, yarn, ribbon, anything you have available and suitable to use for binding
- Colored markers or colored pencils to decorate and label their journal

For Nature Journaling:

- Pencils and/or colored pencils for sketches (pens are optional)
- Erasers
- Firm backing to support journal while drawing. This can be firm cardboard pieces, books, clipboards, etc.
- Bags if collecting objects to draw and study indoors. Please only collect fallen objects such as leaves, twigs, etc., to preserve the plants and natural communities.

* Nature journaling is the focus for this activity. If there isn't time to create a journal simply get students started by using any sized paper and provide them with a firm backing for their sketches. Sketches can be collected in an envelope for each student.

Procedure: Make a Journal

1. Decide what size journal the students will make. Either fold papers in half horizontally or cut copy paper or drawing paper to desired size. Distribute enough paper to students so they have at least 10 pages each for their journals.

2. Have students punch holes with a hole punch or 3-hole punch on the folded side of the paper where they will bind their journal. Students may need help with the hole punch if the paper is thick.

3. Distribute construction paper or board for covers. Make sure covers are at least ¼" bigger than the cut paper in order to cover journal completely.

4. Next, have students draw nature designs on their cover if they wish or keep it simple with their name and journal title.

5. Have students punch holes in the two covers to line up with the inside papers.

6. Bind the journal with string, yarn, ribbon, cord or whatever you have available.

Procedure: Nature Journaling

For this lesson choose a suitable area in the schoolyard, a nearby park, or wherever you determine to explore. Tell students that they will be going outdoors to observe the natural. By adding drawings and words to their journals, students will learn to observe, record, and appreciate nature.

1. Before you take students outdoors, have a brief conversation about Audubon and what a naturalist is, talk with the class about what they think they will find once outside—flowers, insects, birds, etc., and the weather they will observe.

2. Remind students that the journal isn't a competition or a test, but a recording of what they see in nature. Drawing nature helps you observe and to note details such as shape, texture, surface, and spatial relationships.

3. For each journal entry students should include the date, to establish the season; the place (school yard, park, backyard, etc.); the time, either clock time or late morning, early afternoon, etc.; and the weather conditions, sunny, cloudy, cold, warm and so on.

4. On the first page students may want to write the purpose of the journal. For example, my journal is to explore and study nature, to learn about my environment, to record insects and plants in the schoolyard, etc. Also include the student/artist/naturalist name, location, and class. Encourage them to add drawings to the first page, etc.

5. Begin exploring and journaling. Take students to selected area outside and ask the group to find a place they want to stay in for ten or fifteen minutes. Ask students to write down their first impressions: What do they hear? What is the first thing they see?

6. Next have students begin their journal entries.
• Have them focus on still objects and look for clues of animal presence and activity such as holes chewed in leaves by insects, feathers, seeds and nuts from trees, animal tracks, etc.

• Tell students to get close to individual objects where they can closely examine a flower, clover leaf, insect, dandelion, lizard or bird in a tree. Five minutes observing and sketching each object should be enough time for students.

• Ask them to try to draw everything actual size or have them write down size estimates using their own body parts, for example the size of their fist, their index finger, etc. They should label the items if they know what they are for example a maple tree, a sunflower, or a ladybug.

• Describe what an animal is doing, or what an insect is eating, or what a natural object is part of such has "a fallen maple leaf" from the tree above.

• Ask the students what light, colors, shapes, and patterns do they notice?

7. After students are finished outside return to the classroom to discuss what they observed, what were the most interesting things they observed, and what did they learn about the natural world.

Hint:
As the teacher, participate and journal along with your students. This way you can share some of the things you learned during the journaling time.

Extended Lessons:
• Keep and use the nature journal for the entire school year. Students can observe and record any changes in school yard habitats and natural surroundings such as the color and shapes of the trees. Also, delve deeper into the earth sciences and have students include the sunrise and sunset times in their journals. Get the information from the newspaper and post it on the board so students can enter it into their journals when doing their outdoor journaling. At the end of the school year have a discussion about the length of the days, how the days changed with the seasons, how the lighting changed, etc.

• Ask the students to create a detailed drawing or painting based on their journal sketches and notes created in their journal.

• Expand the use of the student's nature journals when they're not in school. Encourage them to observe nature in their own backyard, by bird feeders, in gardens, the sky, in nearby ponds, lagoons, the beach, parks, city streets, or inside their home.

This lesson was created from ideas found in *Keeping a Nature Journal: Discover a Whole New Way of Seeing the World Around You* by Clare Walker Leslie and Charles E. Roth.

Suggested Activity
Wrap Up: A To Z Mammal Alphabet Book

FOCUS
After viewing and discussing Audubon's mammals and his skills and achievements as a naturalist and artist, have students create their own Mammal Alphabet Book to explore the world of mammals from A to Z.

Students will make accordion books about various mammals using the alphabet as a guide. These handmade books can either be expanded outward or kept flat. They are visually exciting and are great for exhibits and displays because you can stand them up and view both sides.

Time: Variable, two to three class sessions

Materials:
• Strips of paper cut to size. 12" x 18" drawing paper or construction paper will work best to cut even strips for each student. Students will need two strips of paper each to equal 6"(h) x 18"(w).
• Cardstock, poster board, or tag board for covers, two for each student. The covers should be the same size, or to make it easier for students make covers at least ½" larger than the folded book size. The folded book size will be 6"x 4 ½."
• Bone folder, wooden tongue depressor or ruler
• Glue stick
• Scissors
• Pencils, colored pencils or pens for covers and inside pages
• List of mammals—the San Diego Zoo has a great Web site to research animals. Go to the mammal link for different mammals at Animal Bytes: http://www.sandiegozoo.org/animalbytes/index.html
• Books, animal resources, Encyclopedias, Field Guides, Magazines such as ZooNooz, National Geographic, Audubon, etc.

Helpful Hints:
• Make a model of the book structure before the lesson.
• Avoid cheap paper, it tears easily.
• If your paper supply is limited reduce the size of the final book by making the inside paper smaller and reduce the size of the covers.
• Think about asking volunteers to help pre-cut the papers and for assembly.
• For pre-cut oversized covers *Michaels, The Arts and Crafts Store* sells 6"x 6" cardstock (100 sheets in assorted colors for under $5.)

Preparation:
Cut the 12" x 18" paper horizontally into two even strips to equal 6"(h) x 18" (w)
Cut enough so each student has two strips. Make extras for mistakes.
Cut Cardstock covers. Each cover should be the same size as the folded book, 6" x 4 ½", or cut larger to make assembly easier for students.

Procedure: Part I (One class session)
Ask students what they've learned about art and animals after viewing the artworks in this guide. Have them think about the animals' habits, habitats, physical characteristics and how Audubon used colors, textures, and backgrounds to portray the animals more naturally.

1. Tell students the class will be making Mammal Alphabet Books. Each student will create their own accordion book to represent a mammal whose name begins with (or includes) one letter of the alphabet. In their book, each student will research and write some facts about a selected mammal along with drawing a picture of the animal. (This lesson will fluctuate depending on your class size—please assign two letters to a student if need be, omit letters if need be, etc.,)

2. Write a list of mammal choices on the board that start with the letters of the alphabet or have students research their own. For difficult letters be creative. For example, for "X" use an animal that has "X" in its name like an oryX—a type of antelope.

3. You can either assign a letter to each student or find a fun and diplomatic way for students to choose their own letters and corresponding mammals.

4. Using library books, classroom books, encyclopedias, the internet, magazines, etc., have students research and take notes about their selected mammal keeping in mind some of the following things: what is the animal's classification, order, genus, species, etc.; what is its scientific name; what are the animal's physical characteristics such as weight and height; what is the animal's lifespan; how many offspring does it have; in what geographic area can the animal be found, what is its habitat; what does the animal eat (is it a carnivore, herbivore, etc.); are there any interesting facts about the animal, etc.

5. Make sure students collect pictures of their mammals so they can reference them when making their drawings. Keep in mind for the next part of this lesson: students can either do their animal drawings on drawing paper and paste them into their book, or draw directly onto the page. You can also give them the option to include collage by clipping animal images, etc. from animal/nature magazines and Web sites.

Procedure: Part 2 (One to two class sessions)
Making and Designing the Accordion Book

Distribute materials to each student: 2 strips of paper, 2 pieces of cut cardstock for covers, tongue depressor for folding, pencils, pens, and glue sticks.

1. Have students fold the first strip of 6” x 18” paper in half and crease the edge using the tongue depressor.

2. Next, fold one end to meet the center fold, creasing the edge of the paper.

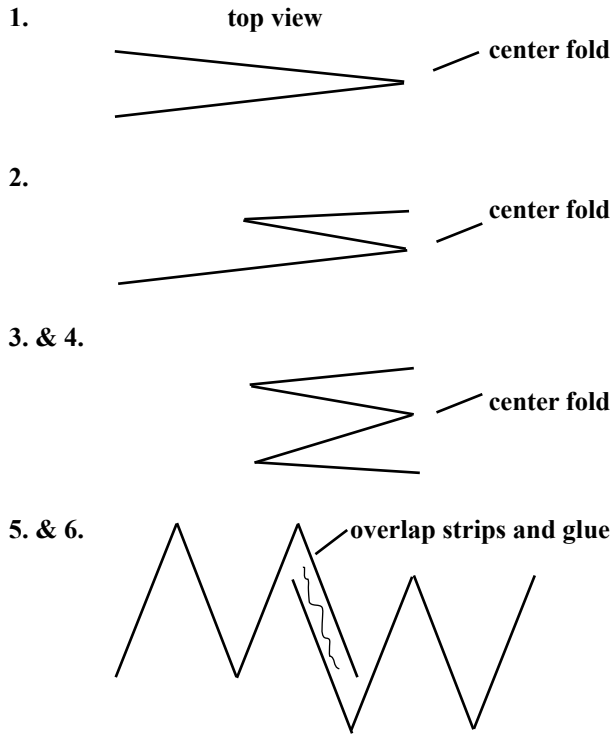
3. Next, fold the other end to meet the center fold, creasing the edge of the paper. If you hold the paper by both ends it should look like the letter “M or W.”

4. Repeat the same thing with the second strip of paper.

5. Next, lay the strips of paper in a line; the first strip should be placed like the letter “M” the second strip of paper upside down like the letter “W.”

6. In order to make a 12 page accordion fold book, the two strips have to be glued together. Overlap and glue the right page of the “M” strip to the left page of the “W” strip as shown.

7. Next, have students figure out which way they want their book to open and then put an X where the covers will be attached. Covers will be glued on last.



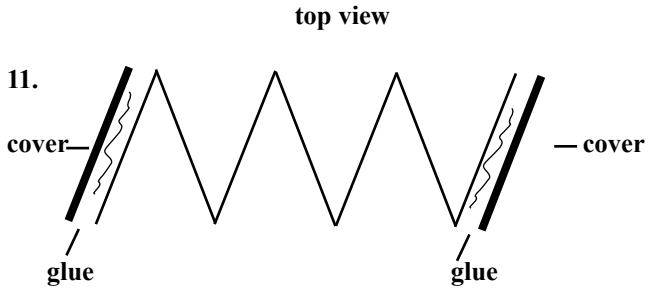
8. Have students design their books. If there is time they can plan out the covers and pages of their book on scrap paper.

9. On the inside pages they can include what they learned about their animal by writing down animal facts alongside pictures, animal habitat drawings, etc. Students can put one fact on each page with related drawings or create their own design. Have the “Images” included in this guide available for the students to reference. Have them pay attention to Audubon’s use of color, texture, and how he included the animals’ natural habitats in his drawings.

10. For the covers, students can creatively include their alphabet letter, and the animal name or a picture.

11. Lastly, attach the book covers. Glue the cut card stock covers to the first and the last page of the paper accordion pages. Use a tongue depressor to hold down the edges of the glued cover to the accordion pages.

12. Allow time for students to share their books in class and to make descriptive presentations about their animal. Encourage students to ask thoughtful questions about the animals presented.



Literary Connections

These books may be found at the Georgina Cole and Dove Libraries located within the City of Carlsbad. If you would like to find out more details about each book go to the City's Web site at http://www.ci.carlsbad.ca.us/library/ Click on "Library Catalogue." This will take you to the search engine. Searches may be under titles, topics, and/or authors.

City of Carlsbad Library
1775 Dove Lane
Carlsbad, CA 92011
760/602-2049

Georgina Cole Library
1250 Carlsbad Village Drive
Carlsbad, CA 92008
760/434-2994

There are numerous books about John James Audubon, Art, Mammals and Nature. This is only a sampling of available books at the Carlsbad Libraries.

743.69 AMB/OVERSIZE
Amberlyn, *J.C. Drawing wildlife*

599.097 AUD/OVERSIZE
Audubon's Wildlife: The Quadrupeds of North America, Complete and Unabridged

599.097 ELM
Elman, Robert. *The living world of Audubon mammals*

598.092 AUD
Irmscher, Christoph. *John James Audubon: Writings and drawings*

598.092 AUD
McDermott, John Francis. *Audubon in the West*

599.097 REA
Reader's Digest North American wildlife. Mammals, reptiles, and amphibians

598.092 AUD
Sanders, Scott Russell. *Audubon Reader: The best writings of John James Audubon*

599.097 WHI
Whitaker, John O., Robert Elman, and Carol Nehring. *The Audubon Society field guide to North American mammals*

Literary Connections

Books for Children and Youth

JB AUDUBON, J.
Armstrong, Jennifer and Jos. A. Smith. *Audubon: Painter of Birds in the wild frontier*

JB AUDUBON, J.
Burleigh, Robert. *Into the woods : John James Audubon lives his dream*

J 920 BRE
Brenner, Barbara. *On the frontier with Mr. Audubon*

J 743.7 COU
Court, Rob. *How to draw things in nature*

J 743.6 HAR
Hart, Christopher. *Kids draw animals*

J 598.092 KAS
Kastner, Joseph. *John James Audubon*

J 743.6 WAL
Walsh, Patricia and David Westerfield. *Woodland animals*

Glossary

Background—the area in a painting that appears to be in the distance.

Balance—a principle of design, it refers to the way the elements of art are arranged to create a feeling of stability in a work.

Carnivore—an animal that eats meat.

Classification—a way of grouping living things to show how they are related.

Color—the visual sensation dependent on the reflection or absorption of light from a given surface. The three characteristics of color are hue, value, and intensity.

Composition—the plan, placement or arrangement of the elements of art in a work.

Ecosystem—a system made up of an community of living things interacting with their environment especially under natural conditions.

Elements of art—sensory components used to create works of art: line, color, shape/form, texture, value, space.

Emphasis—special stress given to an element to make it stand out.

Foreground—the area in a painting that seems closest to the viewer.

Form—a three-dimensional volume or the illusion of three dimensions (related to shape, which is two-dimensional); the particular characteristics of the visual elements of a work of art (as distinguished from its subject matter or content).

Habitat—the environment needed by a particular species for survival.

Hatching—creating tonal or shading effects with closely spaced parallel lines.

Herbivore—an animal that eats mainly plant material, especially leaves, buds, shoots, fruits and stems, and flowers.

Line—a point moving in space. Line can vary in width, length, curvature, color, or direction.

Mammal—a warm-blooded animal with fur that feeds its young on milk.

Middle ground—the area between the foreground and the background.

Movement—the principle of design dealing with the creation of action.

Naturalist—a person who specializes in natural history, the study of natural objects and especially plants and animals as they live in nature.

Pattern—anything repeated in a predictable combination.

Perception—the process of becoming aware through sight, sound, taste, smell, or touch.

Predator—an animal that hunts other animals.

Principles of design—the organization of works of art. They involve the ways in which the elements of art are arranged (balance, contrast, dominance, emphasis, movement, repetition, rhythm, subordination, variation, unity).

Quadruped—an animal having four feet.

Shape—a two-dimensional area or plane that may be open or closed, free-form or geometric. It can be found in nature or is made by humans.

Space—the emptiness or area between, around, above, below, or contained within objects. Shapes and forms are defined by the space around and within them, just as spaces are defined by the shapes and forms around and within them.

Species— a category of living things that is made up of related members able to produce fertile offspring, and is identified by a two-part scientific name.

Taxonomy—the study of scientific classification of organisms.

Texture—the surface quality of materials, either actual (tactile) or implied (visual). It is one of the elements of art.

Value—lightness or darkness of a hue or neutral color. A value scale shows the range of values from black to white.

Viviparous—producing living young instead of eggs from within the body in the manner of nearly all mammals.

Bibliography

Amberlyn, J.C. *Drawing Wildlife*. New York: Watson-Guptill Publications, 2005.

Audubon's Wildlife: The Quadrupeds of North America. Stamford: Longmeadow Press, 1989.

Boehme, Sarah E. *John James Audubon in the West, The Last Expedition: Mammals of North America*. New York: Harry N. Abrams, Inc., Publishers in association with the Buffalo Bill Historical Center, 2000.

Court, Rob. *How to Draw Things in Nature*. Chanhassen: The Child's World, 2005.

Elman, Robert. *The Living World of Audubon Mammals*. New York: Grosset & Dunlap Publishers, 1976.

Grassy, John and Chuck Keene. *Audubon, First Field Guide: Mammals*. New York: Scholastic, Inc.,1998.

Leslie, Clare Walker and Charles E. Roth. *Keeping a Nature Journal: Discover a Whole New Way of Seeing the World Around You*. Massachusetts: Storey Books, 2000.

Parker, Steve. *Eyewitness Mammal*. London: DK Publishing, Inc., 2004.

Shedd, Warner. *The Kids' Wildlife Book*. Charlotte: Williamson Publishing Co., 1994.

Walsh, Patricia and David Westerfield. *Woodland Animals*. Chicago: Reed Educational & Professional Publishing, 2001.

Wilsdon, Christina. *Audubon Adventures: Mammals Inside & Out*. New York: National Audubon Society, 2001.

Web sites

"About Audubon" and "John James Audubon," National Audubon Society retrieved from http://www.audubon.org/nas/jja.html

"American Beaver," National Wildlife Federation retrieved from http://www.enature.com/flashcard/show_flash_card.asp?recordNumber=MA0072

"Animal Bytes" and "The Nose Knows," San Diego Zoo retrieved from http://www.sandiegozoo.org/animalbytes/index.html

"Animal Classification," Discovery Education retrieved from http://school.discovery.com/lessonplans/programs/animaladaptations/

"State Animal," History and Culture-State Insignia: California State Library retrieved from http://www.library.ca.gov/history/cahinsig.cfm

Appendix

Bear Texture--Warm-up

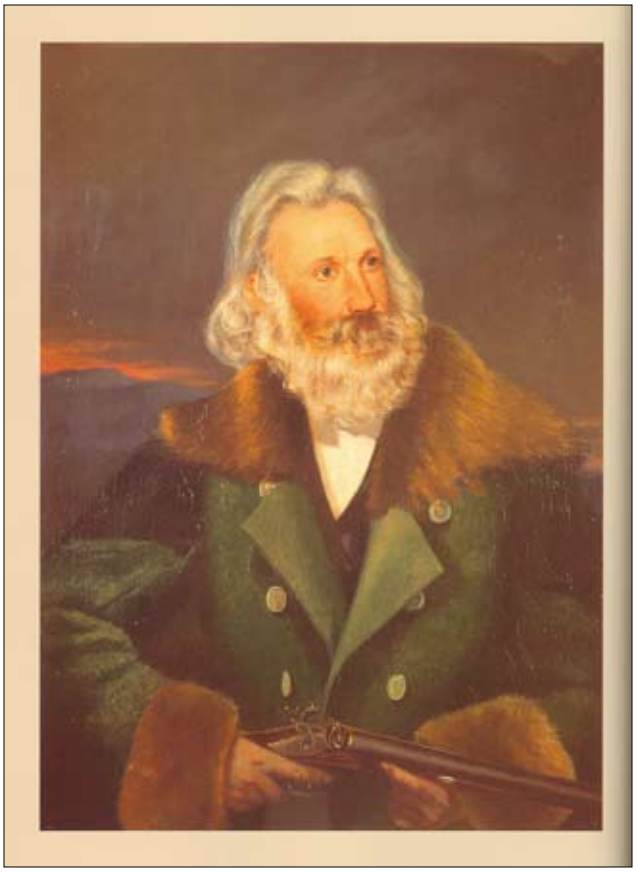
Having hair is a necessary characteristic of being a mammal so it is an important element in your drawings of wild animals such as bears. For greater realism it is important to pay attention to the growth pattern of the hair. A bear's fur consists of two types of hair – the UNDERFUR and the OUTER GUARD HAIRS.

•The underfur is soft and dense and serves primarily as an insulator. They tend to be shorter, curly, and denser than the top.
•The outer guard hairs are much thicker, longer, and coarser. They insulate and protect the body from foreign objects such as dirt, debris and insects.

Directions: Repeat the sample in the open square.

Bears are flat-footed. Their heels and palms touch the ground like human feet. Fur sometimes covers the detail of the feet but curved claws are always visible. Below practice a bear's feet.					
					
Hatching--closely spaced parallel lines helps create shading effects. Shading shows change from light to dark or dark to light in a picture by darkening areas that would be shadowed and leaving other areas light. Practice below.					

Bear feet drawing from *Drawing Wildlife* by J.C. Amerlyn.



Spectacular Achievements:
Audubon's Animals of North America

William D. Cannon Art Gallery
Carlsbad City Library Complex
1775 Dove Lane
Carlsbad, CA 92011

The Cannon Art Gallery is a program of
the Cultural Arts Office/City of Carlsbad